

R1
introducing aluminum oxide particles into the provided chamber;
dispersing the particles within the provided chamber; and
forming the aluminum oxynitride comprising passing nitrogen gas over the dispersed particles.

2. The method of claim 1, wherein forming the aluminum oxynitride comprises heating the particles.

R2
3. (Amended) A method of making aluminum oxynitride, the method comprising:
providing a chamber having a temperature equal to or greater than 1700°C;
introducing a mixture comprising aluminum oxide and carbon into the provided chamber;
dispersing the particles within the provided chamber; and
forming the aluminum oxynitride comprising passing nitrogen gas over the dispersed particles

4. The method of claim 1, further comprising introducing a reducing agent into the chamber to form a mixture comprising aluminum oxide and the reducing agent.

5. The method of claim 1 wherein forming the aluminum oxynitride comprises heating the mixture.

R3
6. (Amended) A method of making aluminum oxynitride, the method comprising:
introducing a mixture comprising aluminum oxide and carbon into a chamber;
heating the chamber comprising ramping the temperature of the chamber to a temperature equal to or greater than 1700°C;
agitating the mixture within the heated chamber; to make aluminum oxynitride.

7. The method of claim 6, further comprising:
introducing nitrogen gas into the chamber.

8. The method of claim 6, wherein agitating the mixture comprises rotating the chamber.

9. (Amended) The method of claim 1, further comprising:

cooling the aluminum oxynitride;

removing the aluminum oxynitride from the chamber; and

introducing a second mixture comprising aluminum oxide and carbon into the provided chamber.

10. The method of claim 6, further comprising:

forming the aluminum oxynitride into a transparent structure.

11. The method of claim 10, wherein forming the aluminum oxynitride comprises:

forming a green body comprising the aluminum oxynitride; and

sintering the green body.

12. The method of claim 11, further comprising:

isostatically pressing the sintered green body under heat.

13. The method of claim 6, wherein the aluminum oxynitride comprises $\text{Al}_{23-1/3x}\text{O}_{27+x}\text{N}_5$.

x , where $0.429 \leq x \leq 2$.

14. (Amended) A method of making aluminum oxynitride, the method comprising:

providing a chamber having a temperature equal to or greater than 1700°C ;

introducing a first reaction mixture comprising aluminum oxide and carbon into the provided chamber;

agitating the first reaction mixture within the provided chamber to form aluminum oxynitride from the first reaction mixture;

removing the aluminum oxynitride while maintaining the temperature of the chamber; and

15 introducing a second reaction mixture comprising aluminum oxide and carbon into the chamber while maintaining the temperature of the chamber.

15. The method of claim 14, further comprising:
introducing nitrogen gas into the chamber.

16. The method of claim 14, wherein introducing the first reaction mixture comprises introducing the first reaction mixture from a hopper.

17. The method of claim 14, wherein agitating the first reaction mixture comprises rotating the chamber.

18. The method of claim 14, wherein the chamber comprises an exit opening and removing the aluminum oxynitride comprises retracting a plunger within the chamber, thereby allowing the aluminum oxynitride to flow through the exit opening.

19. The method of claim 14, further comprising:
forming the aluminum oxynitride into a transparent structure.

20. The method of claim 19, wherein forming the aluminum oxynitride comprises:
forming a green body comprising the aluminum oxynitride; and
sintering the green body.

21. The method of claim 20, wherein forming the aluminum oxynitride comprises:
isostatically pressing the sintered green body under heat.

22. The method of claim 14, wherein the aluminum oxynitride comprises $\text{Al}_{23-1/3x}\text{O}_{27+x}\text{N}_{5-x}$, where $0.429 \leq x \leq 2$.

~~23. An aluminum oxynitride made according to the method of claim 6.~~

24. The aluminum oxynitride of claim 23, wherein the aluminum oxynitride comprises $\text{Al}_{23-1/3x}\text{O}_{27+x}\text{N}_{5-x}$, where $0.429 \leq x \leq 2$.

25. (Amended) A method of making aluminum oxynitride, the method comprising:
providing a chamber having a temperature therein equal to or greater than 1700°C;
continuously introducing a reaction mixture comprising aluminum oxide and carbon into
the provided chamber;
agitating the reaction mixture within the provided chamber; and
continuously providing the aluminum oxynitride.

26. The method of claim 25, further comprising:
forming the aluminum oxynitride into a transparent structure.

27. The method of claim 26, wherein forming the aluminum oxynitride comprises:
forming a green body comprising the aluminum oxynitride; and
sintering the green body.

28. The method of claim 27, wherein forming the aluminum oxynitride comprises:
isostatically pressing the sintered green body under heat.

29. The method of claim 25, wherein the aluminum oxynitride comprises $\text{Al}_{23-1/3x}\text{O}_{27+x}\text{N}_{5-x}$, where $0.429 \leq x \leq 2$.

30. (new) The method recited in claim 6 wherein the ramp rate is greater than 10-20 °C/min to a soak temperature of about 1700-1900 °C.

31. (NEW) The method recited in claim 30 wherein the soak time is about 10-30 minutes

REMARKS